OFF-PLANT OU ECOLOGICAL ASSESSMENT

IMPLEMENTATION ACTIONS – FLUORIDE REMEDY
Off-Plant OU, EMF[1]
JUNE 2020

On June 8, 1998, the US Environmental Protection Agency signed a Record of Decision that selected remedial actions for the Eastern Michaud Flats Superfund Site. The remedy was developed in accordance with the requirements of CERCLA and the NCP. The ROD divides the site into two operable units and the Off-Plant Area. The Off-Plant Area was defined in the ROD as "all land surrounding the FMC and Simplot plants with contamination originating from the plants". The Off-Plant Area later became know as the Off-Plant OU (OU 3).[2]

The selected remedy for the Off-Plant OU, as presented in the 1998 ROD, is presented as three actions – Fluoride Monitoring, Soils, and Groundwater Monitoring. This report speaks only to the Fluoride Monitoring portion of the remedy. The objective of the remedy is to prevent potential risks from fluoride to ecological receptors in the Off-Plant OU.

The fluoride monitoring remedy requires monitoring fluoride near the FMC and Simplot plants, evaluation of the data and, if unacceptable risks are indicated, identification of appropriate source control or other actions. If a source is an ongoing release and subject to state or federal rules, any further control actions are to be deferred to the appropriate state or federal authority (ROD 10.1.5, 10.2.4). The primary source of fluoride has been identified as ongoing air emissions from the Simplot Don Plant. This source is an ongoing release and is permitted by DEQ.

Background
The EMF Superfund Site is located about 2.5 miles northwest of the Pocatello, Idaho, and is partially located within the Fort Hall Indian Reservation. The Off-Plant OU is comprised of "all land surrounding the FMC and Simplot Plants with contamination origination from the Plants". The Bottoms Area, a tribally significant area located in the delta formed as the Portneuf River flows into American Falls Reservoir, is located two to six miles north of the Site. Current land use in the Off-Plant OU include light industrial/commercial, agricultural, residential and tribal traditional and cultural uses.

Contamination at the EMF Superfund Site was generated by releases from the processing of phosphate ore at two facilities. The first, the J.R. Simplot Company, has produced fertilizer at the Don Plant since 1944. In general, the CERCLA remedy for the Simplot OU addresses historic releases from the Don Plant while current operations are regulated under other federal, state and local programs. The second facility, the FMC elemental phosphorous plant, produced elemental phosphorus from phosphate ore from 1949 through 2001. Between 2002 and 2006, the FMC plant was closed, and the facilities were demolished. The remedy selected for the FMC OU addresses historic releases from the FMC facility.

Particulates associated with air emissions from operations at the Simplot and FMC facilities have settled on nearby surface soils and vegetation. The Remedial Investigation (Bechtel, 1996) identified fluoride as the only COC with potential ecological risks above the EPA's CERCLA risk thresholds. The source was identified as air emissions from current Don Plant operations, a source that was, and continues to be, regulated under a State air permit.

[1] Jeremy Jennings, Remedial Project Manger, Superfund and Emergency Management Program, EPA Region 10. Seattle, WA. June 2020.

[2] Pursuant to an agreement between FMC and Simplot to allow for creation of two Remedial Design/Remedial Action Consent Decrees, the 1998 ROD presented the actions for the Off-Plant Area as part of both the FMC OU and the Simplot OU. Following review of comments received during public comment, the two Consent Decrees were never finalized in this form and the actions identified for the Off-Plant Area were addressed as a separate OU, the Off-Plant OU.

The 1995 human health risk assessment found that fluoride concentrations in soils and plants were at levels below human health screening values. Therefore, human health risks from fluoride were not quantified and the remedy identified in the ROD did not address human health risks from site sources of fluoride.

The 1995 ecological risk assessment found that potential risks to some plants, mammals and birds in some areas of the Off-Plant OU exceeded the EPA's risk threshold (HQ=1). The risks were driven by fluoride exposure through consumption of leafy-green vegetation, that dies off each winter and reemerges in the spring. The highest risks were identified for sage grouse in the Michaud Flats (HQ=3.29). However, widespread or significant ecological effects at the population and community levels were not expected.

> *Potential risks of adverse effects of fluoride on resident plant and wildlife species of the sagebrush steppe ecosystem were identified. … The estimated risks of fluoride are only marginally above the threshold for toxic effects and by inference the species at risk may be marginally but not severely affected. Because the potential risks were quantified for effects on individual organism using conservative assumptions to account for uncertainty, and because the upland species most likely to be impacted occur commonly throughout the region, widespread or significant ecological effects at the population and community levels are not expected.*
>
> *Given the ongoing air emissions and cumulative toxicity of fluoride, the potential for impacts is expected to increase over time with continued air deposition. A reduction in fluoride loadings could allow for a reduction in the potential for harmful effects on the ecosystem in the future, as well as a reduction in current risks.* (ROD, Section 6.2)

Remedial Action Objective

The overall objective of the selected remedy for the EMF Site is "to provide an effective mechanism for protecting human health and the environment from risks associated with contaminated site soils and ground water".

The cleanup/remedial action objective (RAO) for ecological risks and fluoride is:

> *Prevent the potential for future impacts to ecological receptors by monitoring fluoride at the Site and surface water at springs. If monitoring data indicate that fluoride levels in the environment are increasing beyond that observed during the RI sampling and the potential for an unacceptable ecological risk is indicated, additional actions, including source controls, may be required.* (ROD, Section 7.2)

The Selected Remedy

To address potential impacts to ecological receptors, the EPA's selected remedy includes the following provisions for fluoride.

> *Monitor fluoride levels around the Site in order to determine the levels of fluoride present and to evaluate the potential risk to ecological receptors. If levels which are measured indicate a risk may exist, further evaluation would occur followed by source control or other action, if necessary. (ROD, Declaration)*

Additional detail is provided in Section 10 of the ROD.

> *In order to determine the levels of fluoride present and to evaluate the potential risk to ecological receptors a fluoride monitoring program will be implemented. The monitoring shall occur within a three-mile radius of the FMC and Simplot Plants (there may be specific areas outside the three-mile radius which may contain sensitive species or be of particular ecological or cultural value where sampling should also occur) and shall include sampling of vegetation, soils, and appropriate biomonitors. A monitoring plan including a quality assurance program plan and a sampling plan shall be submitted for EPA approval during the remedial design. An evaluation of monitoring data will be conducted annually to determine the fluoride levels and spatial and temporal trends in the environment. If levels which are measured indicate a risk may exist, further evaluation will occur followed by source control or other action, if necessary.*

One of the challenges in developing the RI was the presence of both historic and ongoing releases to the environment. Congress enacted CERCLA to address historic releases that were not addressed by other Federal environmental authorities. It was intended to augment, not replace, other Federal and State authorities. Therefore, no actions specific to control of air emissions from ongoing operations are included in the ROD.

> *Except as expressly stated in CERCLA, the NCP, or this ROD, the ROD is not designed to address FMC's or Simplot's ongoing operations, or to preclude, or in any way affect, the need for the Companies' ongoing operations or future closure activities to comply with other environmental laws or regulations. (Declaration)*

> *With respect to air quality Superfund is not the appropriate authority to address the ongoing air emissions from an operating facility, and therefore no action specific to control of air emissions is included in this ROD. (9.3.2)*

> *Air emissions from the Plants are to be controlled by other Federal and State regulatory programs however, the final remedy for the site requires a periodic reevaluation of the air pathway to ensure that the remedy remains effective and is protective of human health and the environment. (11.1)*

Further explanation is provided in the ROD's Response to Comments (pages B-4, B-6, B-21 and B-22).

Implementation of the Remedy

In 1998, discussions on an enforcement agreement to implement the remedial design and remedial action were initiated and a draft RD/RA Scope of Work (SOW) was written for the Off-Plant OU. While neither of these documents were finalized, consistent with the ROD, the following fluoride monitoring and assessment activities were conducted. A more detailed summary is presented in *Supplemental Fluoride Monitoring and Ecological Risk Assessment* (EPA, July 2019.

All data and draft work products produced were distributed to the Companies, EPA, DEQ and the Tribes for review and comment. Comments were discussed with the group and, in most cases, resolved prior to finalizing reports. When written comments were submitted, a written response was generally prepared.

<u>Fluoride Monitoring and Assessment</u>

> *Monitor fluoride levels around the Site in order to determine the levels of fluoride present and to evaluate the potential risk to ecological receptors. (ROD, Declaration)*

In initial RD/RA discussions, Simplot asserted that the air emissions monitoring required under their State air permit fulfilled Simplot's obligations for fluoride monitoring. The EPA never provided a direct response. In the absence of other direction, Simplot continued to monitor their emissions pursuant to the requirements in their state permit.

In 2008, the EPA met with Simplot and FMC (the Companies), Idaho Department of Environmental Quality (DEQ) and the Shoshone-Bannock Tribes (Tribes) (technical team) to discuss implementation of the remedy. The parties reviewed implementation actions to date, identified perceived data gaps and discussed how the data gaps would be addressed. As a first step, the Companies agreed to develop a report summarizing historical fluoride data and analyses collected within three-miles of the Don Plant. At the same time, the EPA agreed to work with the Tribes to identify specific areas outside the three-mile radius where sampling may be appropriate due to the presence of sensitive species or their ecological or cultural value. A gap analysis was used to identify uncertainties and develop appropriate means to address each gap. This analysis served as the basis for supplemental activities conducted over the next several years.

Supplemental actions included soil and vegetation sampling; evaluating data trends; updating the ecological risk assessment using updated EPA methodologies and new data; sampling flouride in forage and soils in the Bottoms Area; reviewing potential impacts to bison, honey bees and other potential ecological receptors; comparing flouride data to the Idaho Fluoride in Forage standards; and reassessing potential human health risks from

fluoride. All sampling was performed under QA/QC Plans approved by either EPA or DEQ. In some instances, independent analyses were performed by EPA and the Companies to assist in resolving outstanding concerns.

The major findings from the supplemental sampling and analysis are as follows:

- Fluoride levels present in soils and vegetation in the Off-Plant OU as well as human health and ecological risks associated with fluoride have been well characterized.

- All significant potential risks to ecological receptors were evaluated in the ecological risk reassessment.

- The primary source of fluoride present in Off-Plant soils and vegetation are air emissions from ongoing operations at the Simplot Don Plant. The emissions are regulated under a DEQ air permit.

- Fluoride is deposited on the surface of soils and vegetation near the plant. Fluoride concentrations in soil appear to be limited to the uppermost surface and do not appear to be transferred to vegetation. Most of the vegetation consumed by ecological receptors is deciduous, losing its leaves each fall and reemerging each spring. Thus, fluoride on vegetation do not accumulate over time.

- No seasonal, annual or long-term or statistically increasing trends were identified in the fluoride data. However, in most areas, fluoride levels measured in 2009 were generally slightly lower than those measured during the RI.

- Fluoride in forage grown in some portions of the Off-Plant OU have exceeded the fluoride end points contained in Idaho's forage standards. The source is permitted by the State of Idaho and regularly monitored.

- Fluoride levels in some vegetation adjacent to the Don Plant have the potential to impact ecological receptors at the individual level. However, widespread or significant ecological impacts at the community or population level are not expected.

- Fluoride levels in forage and soils collected from the Bottoms Area are consistent with background conditions.

- Fluoride levels do not present human health risks above CERCLA risk thresholds.

- Fluoride levels in springs downgradient of the Site do not exceed the MCL of 4 ug/L.

In summary, supplemental monitoring and analyses has provided a comprehensive characterization of potential ecological risks from exposure to fluoride in soils and vegetation at the Off-Plant OU. Fluoride in air emissions from Simplot's Don Plant are deposited on the soils and vegetation near the source. Fluoride concentrations on some vegetation have a potential to impact ecological receptors at the individual level. However, widespread or significant ecological impacts at the community or population level are not expected, the level of impact used in evaluating CERCLA actions.

<u>Evaluation of Need for Further Action</u>

> *If levels which are measured indicate a risk may exist, further evaluation would occur followed by source control or other action, if necessary.* (Declaration, 10.1.5.1, 10.2.4)
>
> *With respect to air quality Superfund is not the appropriate authority to address the ongoing air emissions from the operating facility, and therefore no action specific to control of air emissions is included in this ROD. (9.3.2)*

Supplemental monitoring and analyses indicated that the deposition of fluoride released as part of air emissions from the Don Plant has resulted in some risk to ecological receptors. Thus, further evaluation of the sources and the need for action specific controls was initiated. Based on the data and analysis summarized above, EPA has determined that the fluoride comes from a single source, air emissions from the Don Plant. Available information shows that this is an ongoing release that is permitted by the State of Idaho. Therefore, consistent with the ROD, any further control actions fall under the authority of state and federal air programs, not CERCLA. Since there are no other known sources of fluoride, no further risk management decisions or other actions are required under CERCLA.

In reaching this conclusion, the EPA considered the following:

- Monitoring - All the monitoring required by the ROD has been conducted. All specific elements identified in the selected remedy, including sampling of vegetation, soils and appropriate biomonitors, have been sampled. All samples were collected and analyzed consistent with QA/QC Plans.

- Data Analysis - The data has been evaluated to address all end points identified in the selected remedy. Fluoride levels, spatial and temporal trends and other end points have been evaluated. The ecological risk assessment has been updated and used to evaluate potential risks to ecological receptors.

- Fluoride is deposited on soils and vegetation near the Don Plant at levels that present a potential risk to individual ecological receptors, however, widespread or significant ecological impacts at the community or population level are not expected.

- The vegetation of concern is perennial and does not accumulate from one year to the next.

- Source Identification – The fluoride of concern is derived from a single source, air emissions from the Don Plant. The Don Plant is an operating facility with ongoing air emissions that are regulated under a state permit.

- Required Action – CERCLA defers to other state and federal programs to address permitted sources. Any evaluation of further source controls or other actions should be completed under other environmental regulations.

In summary, the EPA's evaluation of available information finds that, additional source control actions, if necessary, fall under the regulatory authority of the State. The EPA has no CERCLA authority to implement additional action.

Remedy Complete

The Fluoride Monitoring remedy identified in the 1998 ROD for the Off-Plant Operable Unit, Eastern Michaud Flats Superfund Site is complete. No further CERCLA actions are required under this part of the remedy.

- All elements of the CERCLA remedy have been addressed.

- All monitoring and assessment required under CERCLA are complete.

- All decisions relative to ecological risks and source control actions under CERCLA are complete.

- No institutional controls for fluoride were identified in the ROD.

- Ecological risks associated with historic releases are below EPA's CERCLA action levels.

- The remedial action objective for ecological risks at the Off-Plant OU has been attained.

The EPA is not required to conduct additional Five-Year Reviews for this OU. As documented above, the RAOs for the remedy have been achieved. In addition, there are no hazardous substances, pollutants or contaminants from historic releases that remain above the thresholds identified in the 1998 ROD and, thus, above levels that could prevent Unlimited Use and Unrestricted Exposure (UU/UE) as defined under CERCLA.

Attachments: Site Map
Supplemental Fluoride Monitoring and Ecological Risk Assessment